Amendments to the Specification

Please replace paragraph **[0001]** with the following amended paragraph:

[0001] The present application is related by subject matter to U.S. Patent Application Serial No~~. *Awaited*,~~ 10/720,617, filed November 24, 2003 (Attorney Docket 2003B125) and to U.S. Patent Application Serial No~~. *Awaited*,~~ 10/720,558 filed November 24, 2003 (Attorney Docket 2003B124) filed concurrently herewith, the entire contents of which applications are incorporated herein by reference.

Please replace paragraph **[0006]** with the following amended paragraph:

[0006] U.S Patent Application Publication No. 2002/0068843 discloses a catalyst for selectively hydrogenating acetylenic and diolefinic compounds with low green oil formation, the catalyst comprising the following active components loaded on a porous inorganic support: (1) at least one of platinum, palladium, nickel, ruthenium, cobalt, and rhodium; (2) at least one of silver, copper, zinc, potassium, sodium, magnesium, calcium, beryllium, tin, lead, strontium, barium, radium, iron, manganese, zirconium, molybdenum, and germanium; (3) at least one rare earth metal selected from scandium, yttrium, and Lanthanides in Group IIIB of Periodic Table of Elements; and (4) bismuth. Preferably, component (1) is platinum or palladium; component (2) is silver, potassium, or sodium; and component (3) is lanthanum or neodymium.

Please replace paragraph **[0009]** with the following amended paragraph:

[0009] Co-pending U.S. Patent Application Serial No~~. *Awaited*,~~ 10/720,617, filed November 24, 2003 (Attorney Docket 2003B125), filed concurrently herewith, describes a catalyst and process for selectively hydrogenating alkynes and/or diolefins, wherein the catalyst comprises support on which is deposited (a) a rhodium component present in an amount such that the catalyst composition comprises less than 3.0% of rhodium by weight of the total catalyst composition; and (b) an indium component present in an amount such that the catalyst composition comprises at least 0.4% and less than 5.0% of indium by weight of the total catalyst composition.

Please replace paragraph **[0010]** with the following amended paragraph:

[0010] Co-pending U.S. Patent Application Serial No. ~~Awaited,~~ 10/720,558, filed November 24, 2003 (Attorney Docket 2003B124), describes a catalyst and process for selectively hydrogenating alkynes and/or diolefins, wherein the catalyst comprises a support, at least two different metal components selected from Groups 8 to 10 of the Periodic Table of Elements, and at least one metal component selected from Group 13 of the Periodic Table of Elements. The metal components can be added to the support by impregnation or co-precipitation.

Please replace paragraph **[0019]** with the following amended paragraph:

[0019] In another aspect, the present invention resides in a catalyst composition comprising:

(a) a support;

(b) a first metal component comprising rhodium;

(b) a second metal component comprising a metal selected from Groups 12 to 15 of the Periodic Table of Elements; and

(c) a third metal component comprising a metal different from those of said first and second components and selected from Groups 1 to 15 of the Periodic Table of Elements[[.]],

wherein at least said first and second metal components are predominantly contained in an outer surface layer of the support having a depth of not more than 1000 microns.

Please replace paragraph **[0042]** with the following amended paragraph:

[0042] In addition to the active metal components discussed above, the catalyst composition also includes a support or binder material. Suitable support materials comprise amorphous inorganic oxides, such as clays, zirconia, alumina, silica, silica-alumina, ceria-alumina, aluminates (such as aluminates of Groups 1 and 2 and of the Periodic Table of Elements), aluminophosphates, magnesium silicate and magnesium oxide-silicon oxide mixtures, crystalline inorganic oxides, such as spinels, perovskites, and molecular sieves, and other solid inorganic materials, such as carbon, silicon nitride, silicon carbide, boron nitride and metal alloys[[,]]. Preferred support materials include zirconia, alumina and ceria-alumina. The binder or support

material conveniently comprises from about 50 wt% to about 99.9 wt%, such as from about 65 wt% to about 99.5 wt%, of the entire catalyst composition.

Please replace paragraph [0051] with the following amended paragraph:

[0051] Another method of applying the ~~or each~~ active metal component to the support is by wash or spray coating. Typically this method involves preparing a catalyst powder of known composition, such as by co-precipitation or impregnation of the desired metals on a first support, and then mixing the catalyst powder with a liquid, such as water, to produce a slurry. The slurry is then milled by ball-milling, jet-milling or any other type of milling technique, until the desired particle size in the suspension is obtained. In addition, the pH of the slurry may be adjusted to a desired value, and one or more modifiers, such as a binder and/or a porosity control agent, may be added. Finally, the slurry is applied to a second support (ceramic or inorganic oxide in any kind of commercial support shape such as monolith, spheres, hollow cylinders, stars and the likes) by spraying or dipping or any other type of wash coating technique. The second support can be same as or different from the first support.

Please replace paragraph [0058] with the following amended paragraph:

[0058] The operating parameters of an alkyne/alkadiene selective hydrogenation process are not narrowly critical and can <u>be</u> controlled in view of a number of interrelated factors including, but not necessarily limited to, the chemical composition of the feedstock, the control systems and design of a particular plant, etc. (i.e., different reactor configurations including front-end, tail-end, MAPD, and BD converters as mentioned briefly above). In general, however, suitable operating parameters include a temperature of from about 20°C to about 150°C, such as from about 30°C to about 100°C, a pressure of from about 100 psig to about 580 psig (690 kPa to 4100 kPa), such as from about 200 psig to about 440 psig (1400 kPa to 3400 kPa), a H_2/C_2H_2 molar feed ratio of from about 1 to about 1000, such as of from about 1.1 to about 800 and, assuming the reaction is in the vapor phase, a GHSV from about 100 to about 20,000, such as from about 500 to about 15,000 or, if the reaction is in the liquid phase, an LHSV of 0.1 to 100, such as from 1 to 25.

Please replace paragraph [0061] with the following amended paragraph:

[0061] In the case of a back-end selective hydrogenation reactor, the inlet operating temperature may range from about 30 to about 150°C, such as from about 40 to about 90°C. Representative operating pressures may range from about 100 psig to about 500 psig (about 690 to 3[[,]]500 kPa), such as from about 200 psig to about 400 psig (about 1400 to 2800 kPa). The GHSV may range from about 1000 to about 10,000, such as from about 3000 to about 8000. Further, the H_2/C_2H_2 molar feed ratio may range from about 0.5 to about 20, such as from about 1.0 to about 1.5. The feedstreams in back-end selective hydrogenation processes [[in]] may contain about 2% acetylene, about 70% ethylene, and the balance other C_2 compounds.

Please replace paragraph [0072] with the following amended paragraph:

[0072] The higher effective diffusivity of H_2 versus C_2H_2 combined with the similar approximated first-order rate constants for the disappearance of the two species contribute to the change of the reactant feed ratio within the catalyst particle. For example, under the assumptions described above, it can be seen from Figure 1 that the reactant ratio begins to exceed the feed ratio after a depth of approximately 200μm within the fresh catalyst eggshell. In addition, if diffusivities are lower than those calculated theoretically, a more drastic effect is observed and the ratio of H_2/C_2H_2 within the eggshell starts to increase[[s]] beyond the feed ratio at a depth of approximately 50μm. For an eggshell depth of 300μm under these conditions, the H_2/C_2H_2 ranges from 1.08 to 1.3 within the shell.

USSN: 10/720,607
Atty. Docket No.: 2003B126
Amdt. dated March 30, 2005
Reply to Office Action of November 30, 2004

Support for Amendments to the Specification

The amendments to the specification are responsive to the Office Action to provide patent application serial numbers which had not yet been assigned and to correct minor grammatical errors. No new matter has been added.